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PATENT ABSTRACTS OF JAPAN

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(71) Applicant: **SUMITOMO METAL IND LTD**

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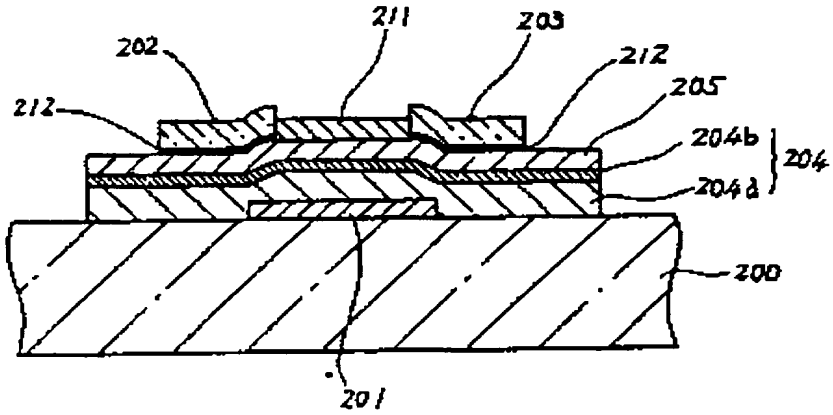
(74) Representative:

(54) **THIN-FILM SEMICONDUCTOR DEVICE**

(57) Abstract:

PURPOSE: To obtain a stable and highly reliable thin-film semiconductor device which hardly shifts a threshold voltage even after a long-term continuous DC operation by a method wherein a gate-insulating layer is constructed in such a way that its optical band gap is made bigger near an active layer and is made smaller near a free surface.

CONSTITUTION: A gate electrode 201 is patterned on a glass substrate 200; an insulating layer 204 composed of a silicon nitride (SiNX), a silicon oxide (SiOX) and the like is formed on the assembly. The insulating film 204 is constructed in such a way that its optical band gap is made bigger near an a-Si:H semiconductor layer 205 acting as an active layer and is made smaller near the gate electrode 201 and the glass substrate 200 acting as free surfaces. As methods to form the insulating layer 204 of this kind, one method is to pile up the optical band gap in stages and by dividing it into more than one different layer; the other method is to shift the optical band gap in the film thickness direction continuously while the supply rate of a raw gas is changed continuously during the process to form the insulating layer 204 as a single insulating layer.



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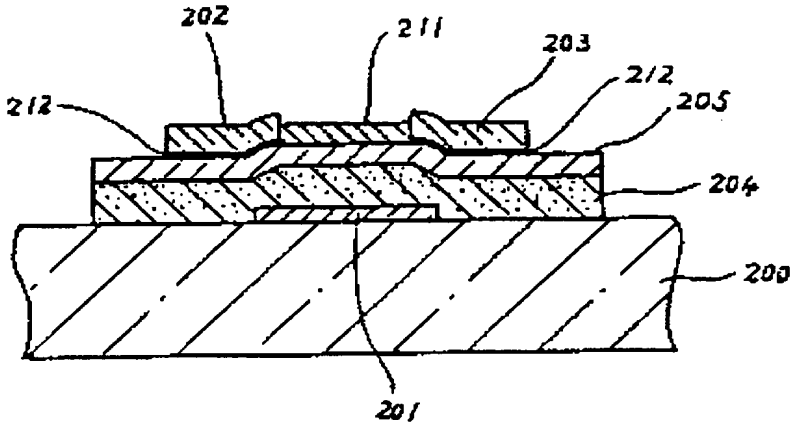

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